

Four new species of *Scaphisoma* Leach with maculate elytra (Coleoptera: Staphylinidae: Scaphidiinae) from Mexico, with new records and comments on *S. balteatum* Matthews

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Abstract

Four new species of *Scaphisoma* are described from Jalisco, Morelos and Oaxaca, Mexico: *Scaphisoma jaliscanum* **sp. nov.**, *S. cortesaguilari* **sp. nov.**, *S. opochtli* **sp. nov.** and *S. versicolor* **sp. nov.** New distributional records and comments on *S. balteatum* are included: it is recorded for the first time from Costa Rica and Jalisco. A key to Mexican species of *Scaphisoma* with maculate elytra and data on their fungal hosts are provided.

Key words: Staphylinidae, Scaphidiinae, *Scaphisoma*, new species, taxonomy, Mexico

Resumen

Se describen cuatro especies nuevas de *Scaphisoma*, con base en ejemplares de Jalisco, Morelos y Oaxaca: *Scaphisoma jaliscanum* **sp. nov.**, *S. cortesaguilari* **sp. nov.**, *S. opochtli* **sp. nov.** y *S. versicolor* **sp. nov.** Se incluyen comentarios sobre *S. balteatum* así como datos nuevos de distribución para esta especie: se registra por primera vez para Costa Rica y Jalisco, México. Se incluye una clave para las especies Mexicanas de *Scaphisoma* con élitros maculados y datos sobre los hongos hospederos.

Palabras clave: Staphylinidae, Scaphidiinae, *Scaphisoma*, especies nuevas, taxonomía, México

Introduction

The genus *Scaphisoma* Leach 1815, like other groups of Scaphidiinae, includes species associated with fungi. Both adult and larval stage feed on fungus and are usually found in sporocarps or in substrates with mycelia like leaf litter and fallen logs. Host records for

Scaphisoma species include species of Agaricales, Aphyllophorales, Polyporales and Tremellales (Ashe 1984, Newton 1984, Leschen 1988, Leschen *et al.* 1990, Hanley 1996).

Scaphisoma is a worldwide genus with more than 600 species (Löbl 1997, 2002, 2003; Löbl & Leschen 2003; Leschen & Löbl 2005). Diversity of *Scaphisoma* is particularly high in tropical areas, e.g. in India 74 species have been recorded (Löbl, 1997, 2003). Mexican fauna of *Scaphisoma* is insufficiently known: only nine species have been recorded (Navarrete-Heredia *et al.* 2002). These species were described by Matthews (1888), Horn (1894) and Champion (1913). Löbl (1992) transferred *Baeocera erichsoni* Matthews, 1888 to *Scaphisoma*.

Scaphisoma species can distinguish from other Scaphidiinae that occur in Mexico by the following combination of characters: last maxillary palpomere gradually narrowed; third antennomere short and triangular, antennomeres VII–XI asymmetrical; post-metacoxal areas slightly elevated (Leschen & Löbl 2005).

The purpose of this paper is to describe four new species of *Scaphisoma* with maculate elytra from Mexico, and provide diagnostic characters and new distributional data for *S. balteatum* Matthews, 1888. The terminology used follows Leschen *et al.* (1990) and Löbl & Leschen (2003). Measurements in descriptions are based on the holotypes. In description of the internal sac the apex and the base refer to retracted internal sac. Abbreviations BMM and BTS used in specimen data correspond to cloud forest and tropical subdeciduous forest, respectively.

Depositories

- BMNH The Natural History Museum, London, United Kingdom (Dr. Martin Brendell)
CZUG Colección Entomológica, Centro de Estudios en Zoología, Universidad de Guadalajara, Zapopan, México (Dr. José Luis Navarrete-Heredia)
FMNH Field Museum of Natural History, Chicago, USA (Dr. Alfred F. Newton, Jr. & Dr. Margaret K. Thayer)
HFL Hugo Eduardo Fierros-López private collection
IEXA Instituto de Ecología, AC, Jalapa, México (M. en C. Leonardo Delgado Castillo)
INBIO Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica (Dr. Ángel Solís)
JLN José Luis Navarrete-Heredia private collection
MNHG Muséum d'histoire naturelle, Genève, Switzerland (Dr. Giulio Cuccodoro)
NMPC Narodni museum, Entomologické odd., Praha, Czech Republic (Dr. Joseph Jelinek)
SEMC Snow Entomological Museum, University of Kansas, Lawrence, USA (Dr. Steve Ashe)

***Scaphisoma jaliscanum* Fierros-López, sp. nov.**

(Figs. 1a, 2a, 3a, 4a–c, 6a)

Type material. **Holotype**, ♂, labelled: México: Jalisco, Casimiro Castillo, Arroyo Tacubaya, 600 m, BST, 19°35'47"N, 104°43'46"W, 5.VIII.2004, *ex Hydnopolyporus fimbriatus*, H. E. Fierros-López col. / **Holotipo**, *Scaphisoma jaliscanum* Fierros-López **sp. nov.**, H. E. Fierros-López des. 2006 (CZUG). **Paratypes**: 47♂♂, 30♀♀, same data as holotype (CZUG (28♂♂, 11♀♀), BMNH (3♂♂, 3♀♀), FMNH (3♂♂, 3♀♀), MNHG (3♂♂, 3♀♀), NMPC, (3♂♂, 3♀♀), SEMC (3♂♂, 3♀♀), JLN (♂, ♀), HFL (3♂♂, 3♀♀); 11♂♂, 13♀♀, same data except: *ex Trametes membranacea* (CZUG); 6♂♂, 6♀♀, same locality except: 17.VIII.2000, *ex Favolus brasiliensis*, H. E. Fierros-López col. (CZUG); ♂, same data except: 15.VI.2002, *ex* tronco con *Favolus brasiliensis* y *Auricularia delicata* (CZUG); ♂, same data except: 11.VIII.2005, *ex Auricularia delicata* (CZUG) ♀, Oaxaca, Candelara, Loxicha, Finca La Media Luna, 26.VIII.2003, 550m, Tr. De Intercepción, Q. Santiago y L. Delgado cols. (IEXA).

Diagnosis. This species is easily distinguished by its color pattern and the following characters: mesocoxal lines parabolic, metacoxal lines parallel to metacoxa; aedeagus with median lobe symmetrical and parameres without preapical modifications; internal sac long and closely coiled up at the base of the aedeagus.

Description. Body length 2.25 mm; head brown-orange, antennomeres I–VI pale yellow, VII–XI brown; pronotum dark brown with two black circles at middle, close to lateral margins; prohypomeron orange; elytra with basal 3/4 black and apex yellow; epipleura dark orange; thoracic ventrites reddish brown; abdomen yellow except first exposed tergite black and second tergite with basal 1/3 black; legs light brown.

Head. Sub-spherical, glossy, with dispersed superficial punctures; clypeus with four setae at lateral margins, two basal and two apical, labrum weakly emarginated, with apex membranous; antenna long, slender; antennomeres with the following length proportions (antennomere length / length of antennomere III): I 3.33, II 1.16, III 1, IV 2.83, V 3.50, VI 3.50, VII 4.16, VIII 3.33, IX 3.60, X 3.16, XI 4.16.

Thorax. Pronotum trapezoidal, disc surface glossy but with numerous shallow punctures with setae, lateral ridge visible in dorsal view; prohypomeron smooth, slightly concave in posterior portion; prosternum reduced; scutellum partially hidden by pronotum; elytra rectangular, sutural stria extended along 2/3 of basal margin length; lateral stria with punctures, curved at anterior margin. Surface of disc with abundant punctures with distinct setae; mesocoxal lines parabolic and metacoxal lines parallel (Fig. 3a); mesepimeron length / length of anapleural line ratio 0.50; metaventrite densely ornamented with superficial punctures and small setae, posterior area of metepisternum with rounded and thick process, apex translucent.

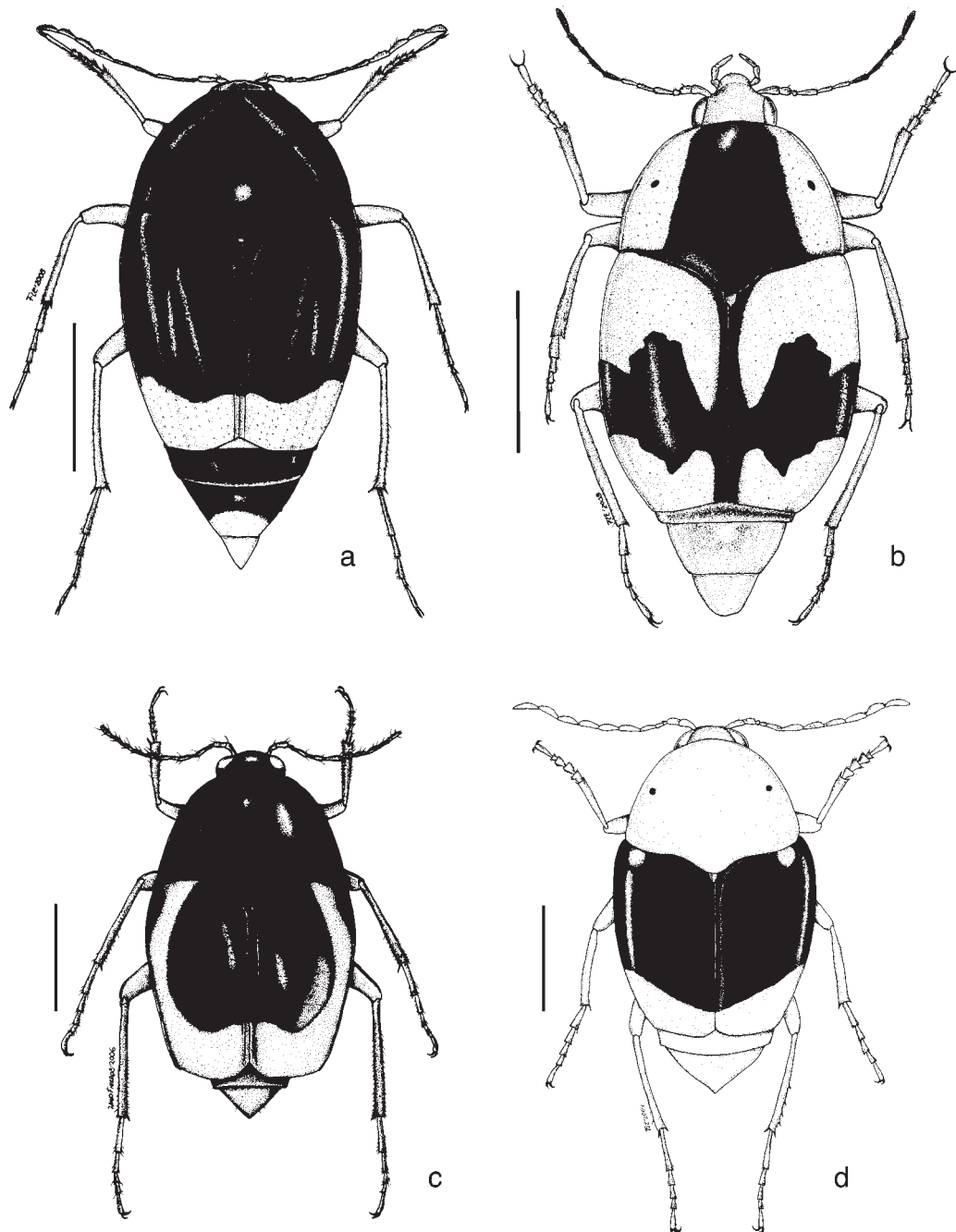


FIGURE 1. Habitus drawings of *Scaphisoma*. a) *S. jaliscanum* **sp. nov.**; b) *S. cortesaguilari* **sp. nov.**; c) *S. opochtli* **sp. nov.**; d) *S. versicolor* **sp. nov.** (all holotypes). Scale bar 1 mm.

Abdomen. Three exposed tergites, glossy, ventrites with fine striate microsculpture.

Aedeagus (Figs. 4a–c). Median lobe with basal portion bulbous, weakly sclerotized, apex pointed and curved dorsally; parameres symmetrical, narrowed in middle portion,

without preapical modifications; internal sac with long flagellum, basal portion closely coiled up, ornamented with fine striate structure.

Female characters. Protarsomeres cylindrical with a few lateral setae; gonocoxites more or less straight, long, slender, wider at base (Fig. 6a).

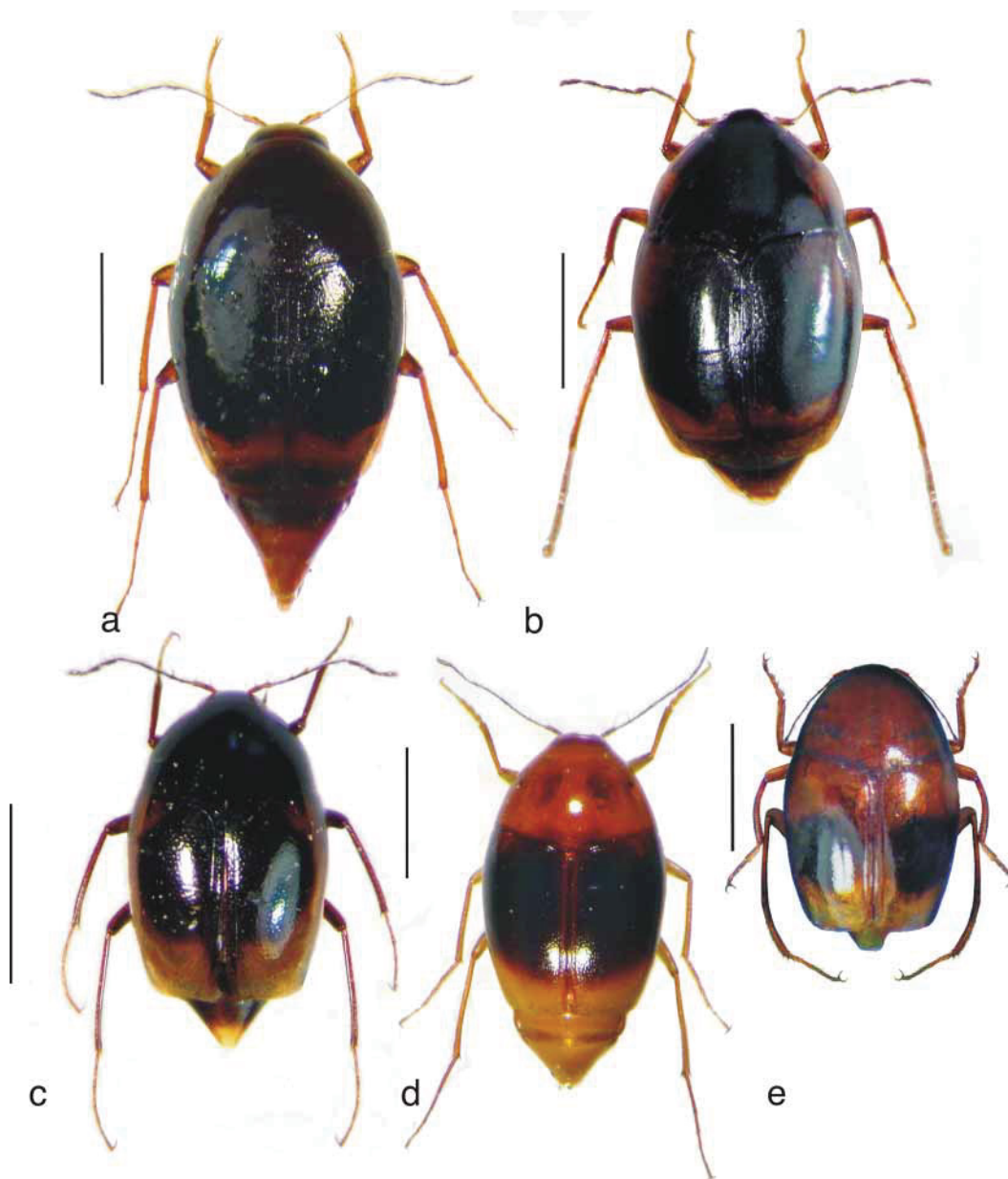


FIGURE 2. Photographs of *Scaphisoma*. a) *S. jaliscanum* **sp. nov.** (paratype); b) *S. cortesaguilari* **sp. nov.** (paratype); c) *S. opochtli* **sp. nov.** (holotype); d) *S. versicolor* **sp. nov.** (paratype); e) *S. balteatum* Matthews. Scale bar 1 mm.

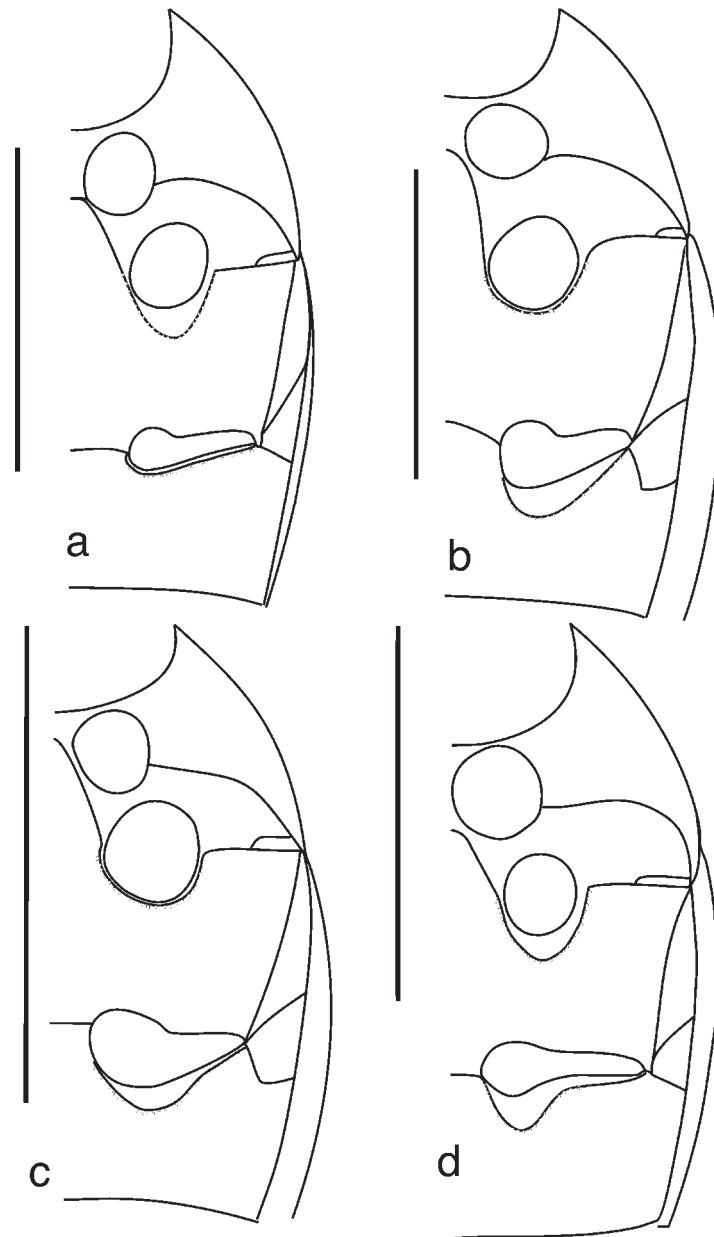


FIGURE 3. Thorax of *Scaphisoma*, ventral view showing meso and metacoxal lines (other punctures are omitted). a) *S. jaliscanum* **sp. nov.**; b) *S. cortesaguilari* **sp. nov.**; c) *S. opochtli* **sp. nov.**; d) *S. versicolor* **sp. nov.** Scale bar 1 mm.

Variation. 39♀♀ and 55♂♂ measured. Body length: ♀: range 2.00–2.30 mm, average± standard deviation 2,21±0.07 mm; ♂: 1,35–2,45 mm, 2,22±0.05 mm; pronotal coloration, may be black or pale brown and in darker specimens the black circles of pronotum are less conspicuous than in the lighter ones. Elytra may have more opaque coloration in the yellow apical portion.

Comments. This species is similar to *Scaphisoma versicolor*, but differs in having larger body size, darker pronotum and ventrites, metacoxal lines parallel, paremeres not modified and internal sac closely coiled up (Figs. 4a–c).

Etymology. The name of this species is derived from the Mexican state where the holotype was collected.

Distribution. Known from the Mexican states of Jalisco and Oaxaca.

Bionomics. This species has been collected in August, in tropical subdeciduous forest on logs with sporophores of *Auricularia delicata* (one specimen) (Auriculariaceae); *Hydnopolyporus fimbriatus* (83 specimens) (Meripilaceae); *Favolus tenuiculus* (= *Favolus brasiliensis*) (one specimen) and *Trametes membranacea* (24 specimens) (Polyporaceae). Other beetles associated were: *Eurycoleus* sp. (Carabidae), Histeridae sp., *Scaphisoma balteatum* Matthews, *S. versicolor* **sp. nov.**, *Scaphidium tlatlahuqui* Fierros-López, *Plociopterus fetialis* (Erichson), *Nordus praedator* Navarrete-Heredia, Fierros-López & Chatzimanolis, *Megalopinus* sp. (Staphylinidae) and *Onthophagus* sp. (Scarabaeidae).

***Scaphisoma cortesaguilari* Fierros-López, sp. nov.**

(Figs. 1b, 2b, 3b, 4d–f, 6b)

Type material. **Holotype**, ♂, labelled: México: Jalisco, Mascota, El Atajo, BMM, 1440 m, 6.VII.2005, 20°38'00"N, 104°51'45"W, ex *Sirobasidium sanguineum*, J. Cortés-Aguilar col. / **Holotipo**, *Scaphisoma cortesaguilari* Fierros-López **sp. nov.**, H. E. Fierros-López des. 2006 (CZUG); **Paratypes**: ♂, 5 ♀, same data as the holotype (CZUG (♂, ♀), BMNH (♀), FMNH (♀), MNHG (♀), NMPC (♀); ♀, Mexico: Jalisco, San Sebastián del Oeste, Cerro de la Bufa, BMM, 1535 m, 20°45'19"N, 104°50'15"W, ex hojarasca, troncos, J. Cortés-Aguilar col. (HFL).

Diagnosis. The species can be identified by color pattern; mesocoxal line parallel to coxa, metacoxal line convex; fourth ventrite of male with two spiniform processes in middle, fifth ventrite of male with a smooth elliptical area, slightly concave; aedeagus with median lobe laterally expanded near apex.

Description. Body length 2.62 mm. Coloration: head yellow, antennomeres I–VI pale yellow, VII–XI brown; pronotum with dark brown median band, lateral areas yellow with one black circle, close to lateral margins; prohypomeron yellow, with inferior surface darker; elytra yellow, with basal, lateral and sutural margins dark brown and one transverse spot, wider at the median portion, on disc; epipleura brown, darker at anterior margin; thoracic ventrites dark brown; abdomen with tergites yellow, central area dusk, first ventrite with basal area brown, rest of the ventrites reddish-brown, lighter at apex; legs yellow, except for light-brown coxae.

Head. Sub-spherical, glossy, with scattered punctures; clypeus smooth, with four marginal setae, two basal and two apical, labrum weakly emarginated, with apex membranous; antenna long, slender, antennomeres with the following length proportions

(antennomere length / length of antennomere III): I 3.50, II 2.00, III 1; IV 2.41, V 2.00, VI 3.33, VII 3.50, VIII 3.00, IX 3.00, X 3.00, XI 4.08.

Thorax. Pronotum trapezoidal, more convex toward apex, disc surface glossy, with numerous superficial punctures, lateral ridge visible in dorsal view; microsculpture consisting of punctures; prohypomeron smooth and glossy, slightly concave in posterior portion; prosternum reduced; scutellum triangular, partially hidden by pronotum; elytra rectangular, sutural stria extended along 1/3 of basal margin length, lateral stria with punctures, curved at anterior margin; disc with numerous superficial punctures and striate microsculpture; mesocoxal lines parallel to mesocoxae and metacoxal lines parabolic (Fig. 3b); mesepimeron length / length of anapleural line ratio 0.30; metaventrite sparse and superficial punctures, with few primary setae, posterior area of metepisternum projected over first ventrite, translucent at apex.

Abdomen. Three exposed tergites, smooth, ventrites microsculpture consisting of points; first ventrite with longitudinal keel, slightly elevate; fourth ventrite with two spine like processes at apex, and fifth ventrite with elliptical area, slightly concave (Fig. 5).

Aedeagus (Figs. 4d–f). Median lobe with basal portion bulbous, apex pointed and dorsally bent; with lateral projections subapically, parameres symmetrical, narrowed in middle, curved toward apex, that is flattened, without preapical modifications; internal sac with flagellum slightly coiled at base, apex with two parallel sclerotized areas, apical sides ornamented with punctures.

Female characters. Protarsomeres cylindrical with few lateral setae; ventrites without modifications; gonocoxites oval, short, evenly wide, flattened (Fig. 6b).

Variation. 3♀ and 2♂♂ measured. Body length: ♀: range 2.30–2.25 mm, $a \pm sd = 2.00 \pm 0.11$; ♂: 2.70–2.85 mm, $a \pm sd = 2.62 \pm 0.01$ mm. Some specimens show darker coloration at the inferior portion of the prohypomeron. Ventrites may be brown with apical margin translucent or yellow except the first ventrite (brown).

Comments. This species is similar to *Scaphisoma balteatum*, but differs in the color pattern: *S. cortesaguilari* has a dark brown macula on pronotal disc and males have a pair of spiniform processes on the fourth abdominal ventrite and a slightly concave elliptical area on fifth ventrite.

Etymology. This species is dedicated to biologist Jes  s Cort  s-Aguilar, collector of the species.

Distribution. Known only from the type locality in the Mexican State of Jalisco.

Bionomics. The species has been collected in June, in cloud forest in leaf litter and rotting logs, associated with *Sirobasidium sanguineum* (Sirobasidiaceae); this species was collected in association with *Epipocus longicornis* Gerstaecker, *Stenotarsus latipes* Arrow, *Stenotarsus* sp. and one undetermined species of Stenotarsinae (Endomychidae), Erotylidae spp., Passalus sp. (Passalidae), Leptochirus sp., Misatlus rufipennis Sharp, Plociopterus fetalis, Xanthopygus flohri Sharp, Bolitogyrus sp. (Staphylinidae).

***Scaphisoma opochtli* Fierros-López, sp. nov.**

(Figs. 1c, 2c, 3c, 4g–I, 6c)

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Type material. **Holotype**, ♂, labelled: México: Morelos, Tlayacapan, San José de los Laureles, Camino a Amatlán, 1721 m, BMM, 19°59'N, 99°00'W, 29.VI.1991, *ex Hydnopolyporus palmatus* II, J. L. Navarrete-Heredia col, 1026 / Holotipo, *Scaphisoma opochtli* Fierros-López **sp. nov.**, H. E. Fierros-López des. 2006 (CZUG). **Paratypes**: 33♂♂, 98♀♀, same data as the holotype (CZUG) (18♂♂, 83♀♀), BMNH (3♂♂, 3♀♀), FMNH (3♂♂, 3♀♀), MNHG (3♂♂, 3♀♀), NMPC (3♂♂, 3♀♀), SEMC (3♂♂, 3♀♀); 2♀♀, same data except: 1768 m, 22.VII.1991, 833 (JLN); ♀, same data except: 14.VIII.1993, *ex* tronco en descomposición, G.A. Quiroz y J. L. Navarrete cols. (CZUG); ♂, same data except: *ex* Polyporaceae, 836 (JLN); ♀, same data except: BP, 1830, 23.VII.1991, *ex* tronco con micelio naranja, 870 (CZUG); ♀, same data except: 29.VI.1991, BMM, 1768 m, *ex* bajo corteza, 690 (CZUG); 3♂♂, 7♀♀, México: Jalisco, Tequila, Volcán de Tequila, BMM, 2450 m, *ex* tronco con micelio, 20°48'12"N, 103°51'11"W, 28.VII.2000, H. Fierros col. (CZUG) (♂, 4♀♀), HFL (2♂♂, 3♀♀); ♂, México, Jalisco, Zapotlán el Grande, Nevado de Colima, BMM, 2545 m, 16.VIII.2002, 19°36'25"N, 103°34'02"W, G. González y H. E. Fierros cols. (HFL).

Diagnosis. The species can be recognized by a distinct coloration pattern and the following characters: mesocoxal line parallel, metacoxal line sinuate; the aedeagus with asymmetric median lobe; parameres long, exceeding 3/4 of the length of median lobe.

Description. Body length 1.70 mm. Head dark brown, with clypeus lighter, antennomeres I–VI light brown, VII–XI brown; pronotum and pronotal hypomeron black; scutellum reddish brown; elytra pale brown with single black spot on disc, the spot reach sutural margin, but not lateral stria, humeral area with brown spot near lateral stria; epipleura brown; thoracic ventrites black; abdomen black but lighter toward apex; legs reddish brown.

Head. Sub-spherical, glossy and smooth, with very fine punctate microsculpture; clypeus glossy with four setae at lateral margins, two basal and two apical, labrum weakly emarginated, with apex membranous; antenna long, antennomeres with the following length proportions (antennomere length / length of antennomere III): I 6.00, II 3.16, III 1.00, IV 1.16, V 2.33, VI 5.00, VII 6.00, VIII 5.00, IX 5.30, X 5.50, XI 3.30.

Thorax. Pronotum trapezoidal, more convex toward apex, disc surface glossy, with numerous shallow punctures, lateral ridge visible in dorsal view; pronotal hypomeron smooth and glossy, slightly concave in posterior portion; prosternum reduced; scutellum triangular and partially hidden by pronotum; elytra rectangular, sutural stria extended along 2/3 of basal margin length; lateral stria with punctures, curved at anterior margin; surface of disc with abundant punctures; mesocoxal lines parallel and metacoxal lines sinuate (Fig. 3c); mesepimeron length / length of anapleural line ratio 0.50; metaventrite glossy, with several punctures and primary setae, posterior area of metepisternum

projected over the first abdominal ventrite, with translucent apex.

Abdomen. Three exposed tergites, with abundant primary setae, ventrites with fine punctate microsculpture.

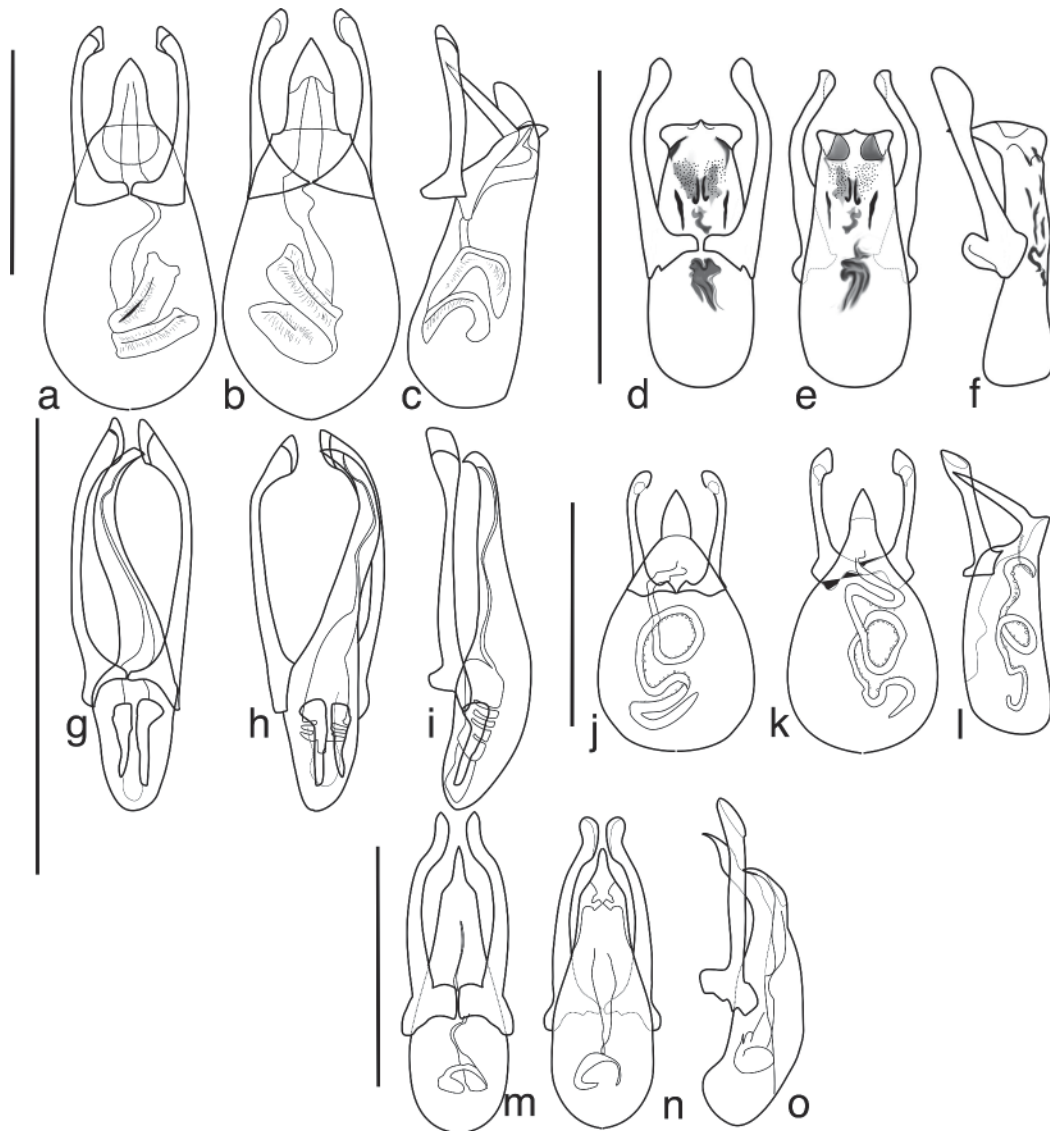


FIGURE 4. Aedeagi of *Scaphisoma*, dorsal, ventral and lateral views respectively. a–c) *S. jaliscanum* **sp. nov.**; d–f) *S. cortesaguilari* **sp. nov.**; g–i) *S. opochtli* **sp. nov.**; j–l) *S. versicolor* **sp. nov.**; m–o) *S. balteatum* Matthews. Scale bar 0.5 mm.

Aedeagus (Figs. 4g–i). Median lobe asymmetric, basal portion short, bulbous and weakly sclerotized, in dorsal view gently sinuate toward left, with apex curved to right; parameres slender in middle portion, with apex slightly curved toward inner area; internal sac with long flagellum, slender and sinuate in apical portion of median lobe, in basal portion of median lobe wider and with lobes.

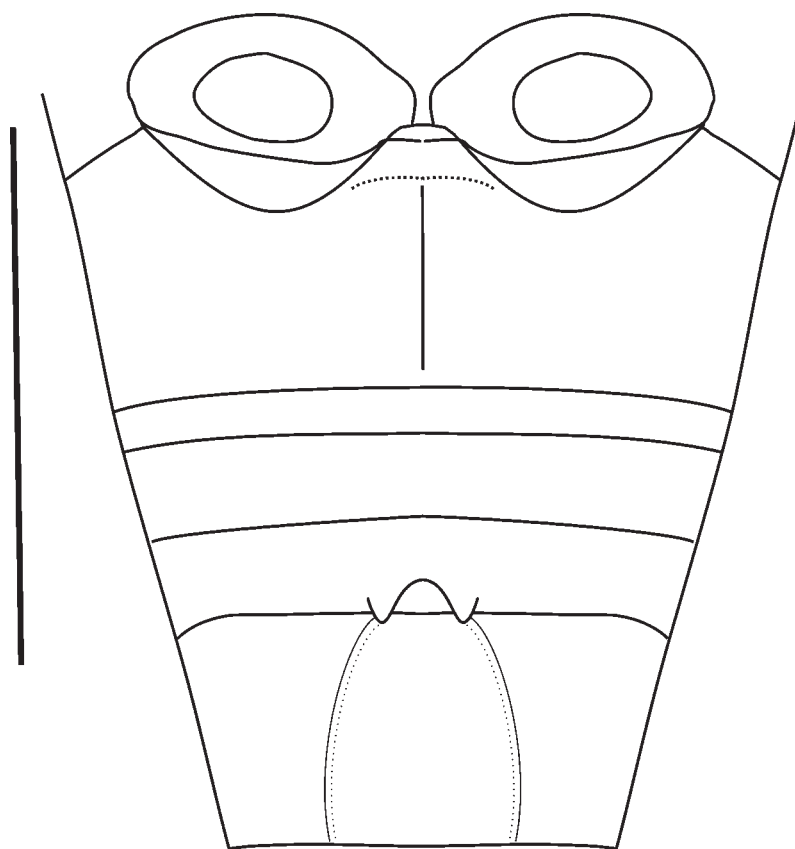


FIGURE 5. Ventral view of male abdomen of *Scaphisoma cortesaguilari* **sp. nov.** Scale bar 1 mm.

Female characters. Protarsomeres cylindrical, with few lateral setae; gonocoxites more or less straight, long, slender, wider at base (Fig. 6c).

Variation. 30♀♀ and 30♂♂ measured. Body length: ♀: 1.66–1.91 mm, $a \pm sd = 1.79 \pm 0.062$ mm; ♂: 1.53–1.83 mm, $a \pm sd = 1.72 \pm 0.063$ mm. Specimens may have darker or pale colorations, particularly on the elytra.

Comments. This species is similar to *S. balteatum*, but differs by the black coloration of the pronotum, the brown spot on the humeral area of the elytra; in males abdominal ventrites are without modifications and the aedeagus is asymmetrical. *Scaphisoma balteatum* has a red pronotum with darkened central area, the fourth abdominal ventrite is bearing two spiniform processes and the median lobe of the aedeagus is symmetrical. The Morelos specimens cited as *S. balteatum* in Navarrete-Heredia *et al.* (2002) belong to *S. opochtli*.

Etymology. The name of the species is derived from the Nahuatl word “Opochtli” (Simeon, 1999), meaning left side, in reference to the curvature toward the left of the median lobe.

Distribution. Known from the Mexican states of Jalisco and Morelos, in the

mountains of the Transverse Neovolcanic belt.

Bionomics. The species has been collected in cloud forest, on rotting logs with mycelia and unidentified mushrooms; the only host which was identified is *Hydnopolyporus palmatus* (132 specimens) (Meripilaceae). Other beetle species associated with *S. opochtli* were: *Scaphisoma* sp., *Toxidium* sp. (Staphylinidae).

***Scaphisoma versicolor* Fierros-López, sp. nov.**

(Figs. 1d, 2d, 3d, 4j–l, 6d)

Type material. Holotype, ♂, labelled: México: Jalisco, Casimiro Castillo, Arroyo Tacubaya, 600 m, BTS, 19°35'47"N, 104°43'46"W, 4.VII.2002, *ex Rigidoporus microporus*, H. E. Fierros-López col. / **Holotipo**, *Scaphisoma versicolor* Fierros-López **sp. nov.**, H. E. Fierros-López des. 2006 (CZUG). **Paratypes**: 10♂♂, 10♀♀, same data as holotype: CZUG (5♂♂, 4♀♀), BMNH, (♂, ♀), FMNH (♂, ♀), MNHG (♂, ♀), NMPC (♂, ♀), SEMC (♂, ♀), HFL (♀); 2♂♂, ♀, same data except: *ex Oligoropus floriformis* (CZUG); 2♂♂, 3♀♀, same locality except: 12.VII.2003 (CZUG); 3♂♂, 3♀♀, same locality except: 5.VIII.2004, *ex Trametes membranacea* (CZUG); 9♂♂, 6♀♀, same data except: *ex Hydnopoyporus fimbriatus* (CZUG); ♂, same data except: 17.VIII.2000, *ex Favolus brasiliensis* (HFL); ♂, same data except: *ex* tronco de *Ceiba* sp. (HFL); ♀, México: Jalisco, Zapopan, Las Agujas, Instituto de Botánica, 6–8.X.1993, J. L. Navarrete y M. Tapia, *ex Pleurotus* spp. (CZUG); ♀, Oaxaca, Santiago Jamiltepec, El Monroy, 10–14.VII.2005, 100m, Trampa de intercepción, L. Delgado col. (IEXA).

Diagnosis. This species has a conspicuous color pattern and can be distinguished by mesocoxal lines parabolic and metacoxal lines sinuate; aedeagus symmetrical with preapical cavity on parameres; internal sac slightly coiled (when inside the median lobe), bearing asperities.

Description. Body length 2.00 mm. Head orange, antennomeres I–VI pale yellow, VII–XI light brown; pronotum reddish-orange with two black circles on apical half, near lateral margins; prohypomeron orange; scutellum reddish-brown; elytra black in basal 2/3, with small, red, humeral spot, apical 1/3 yellow; epipleura orange; thoracic ventrites pale orange; abdomen and legs yellow.

Head. Sub-spherical, glossy, with scattered and fine punctures; clypeus with four lateral setae, two basal and two apical, labrum weakly emarginated, apex membranous; antenna long; antennomeres with the following length proportions (antennomere length / length of antennomere III): I 2.50, II 2.00, III 1.00, IV 1.50, V 4.50, VI 4.50, VII 4.00, VIII 4.00, IX 4.00, X 4.50, XI 4.50.

Thorax. Pronotum trapezoidal, more convex toward apex, disc surface glossy and smooth, with numerous punctures, lateral ridge visible in dorsal view; prohypomeron smooth, slightly concave in posterior portion; prosternum reduced; scutellum triangular, partially hidden by pronotum; elytra rectangular, sutural stria extended along 2/3 of basal

margin length; lateral stria with punctures; disc with several setiferous punctures, microsculpture consisting of points; lateral stria curved at anterior margin; mesocoxal lines parabolic and metacoxal lines sinuate (Fig. 3d); mesepimeron length / length of anapleural line ratio 0.50; metaventrite densely ornamented with punctures and primary setae; posterior area of metepisternum not projected over first abdominal ventrite.

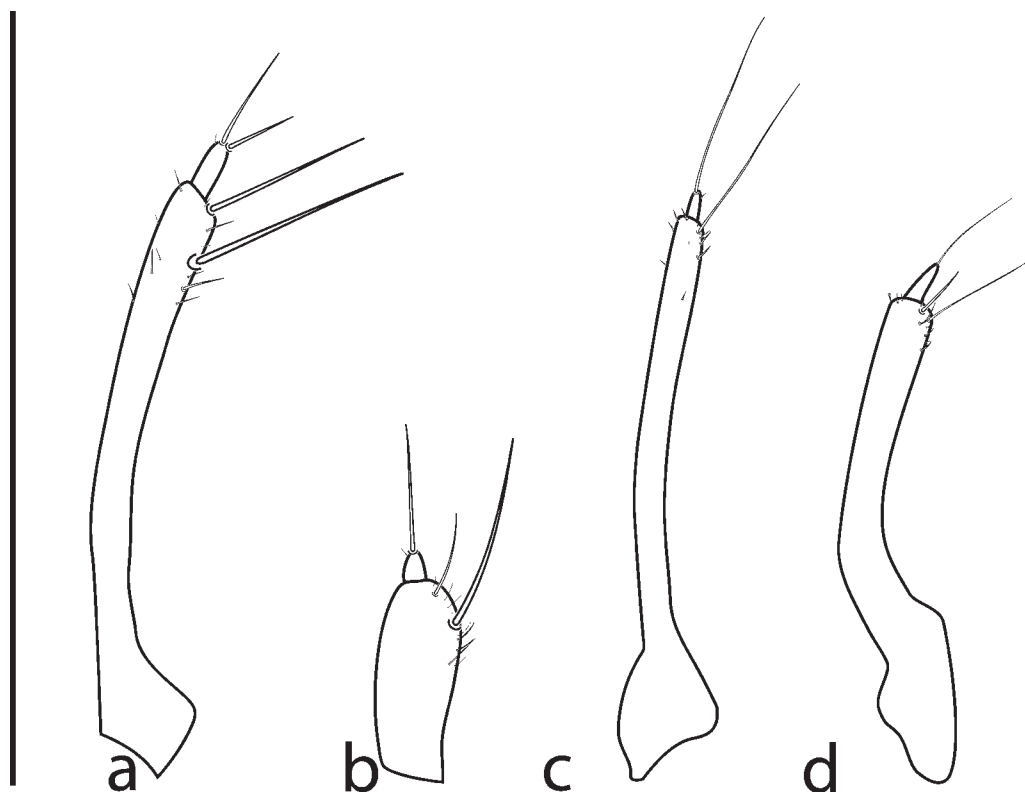


FIGURE 6. Gonocoxites of *Scaphisoma*. a) *S. jaliscanum* **sp. nov.**; b) *S. cortesaguilari* **sp. nov.**; c) *S. opochtli* **sp. nov.**; d) *S. versicolor* **sp. nov.** Scale bar 0.5 mm.

Abdomen. Three exposed tergites, glossy with abundant fine punctures, ventrites with fine striate microsculpture and few primary setae at apex.

Aedeagus (Figs. 4j–l). Median lobe with basal portion bulbous, ovoid in dorsal view, apex pointed and abruptly curved dorsally; parameres symmetrical, wider at base, slender at middle, apex expanded, with preapical modification; internal sac with long and sinuate flagellum, bearing asperities.

Female characters. Protarsomeres cylindrical with a few lateral setae; gonocoxites curved at prebasal region, slender, basally wider (Fig. 6d).

Variation. 13♀♀ and 21♂♂ measured. Body length: ♀: 1.78–2.03 mm, $a \pm sd = 1.92 \pm 0.08$ mm; ♂: 1.79–1.98 mm, $a \pm sd = 1.79 \pm 0.04$ mm, specimens show darker or pale colorations; some teneral specimens are pale orange or yellow without evidence of darker basal area on elytra.

Comments. The species is similar to *Scaphisoma balteatum*, but may be distinguished by the parabolic mesocoxal line and black elytra with an orange humeral spot and yellow apical margin. *Scaphisoma balteatum* has parallel mesocoxal lines and the elytra are orange-red with a black fascia in the middle.

Etymology. The name of this species is derived from the Latin word *ÖversicolorÖ*: of various colors.

Distribution. Known from the Mexican states of Jalisco and Oaxaca.

Bionomics. This species was collected on sporophores of *Hydnopoyporus fimbriatus* (13 specimens), *Rigidoporus microporus* (20 specimens) (Meripilaceae), *Pleurotus* sp.(one specimen) (Pleurotaceae), *Trametes membranacea* (6 specimens), *Postia floriformis* (= *Oligoporus floriformis*)(8 specimens) (Polyporaceae). Other beetle species associated were: Histeridae sp., *Scaphisoma jaliscanum*, *Scaphidium tlatlahuqui*, *Megalopinus* sp., *Plociopterus fetalis*, *Nordus praedator* (Staphylinidae) and *Onthophagus* sp. (Scarabaeidae).

***Scaphisoma balteatum* Matthews, 1888**
(Fig. 2e)

Material examined. Costa Rica: ♂, Guanacaste Prov., Est. Cacao, Lado SO Volcán Cacao P. N., 1000–1400 m, F. A. Quesada, 21–29.V.1992, 10°55'N, 85°28'W, CRI000 523610 (INBIO); ♀, Est. Sta. Rosa, P. N. Sta. Rosa, 300 m, 3–12.VI.1992, III curso Parataxon. 10°50'N, 85°37'W, CRI0000 428007 (INBIO); ♂, Est. Maritza, Lado O Vo. Orosí, 600 m, Tp. Malaise, 1988, 10°57'N, 85°29'W, CRI000 270101 (INBIO); **México:** ♂, Jalisco, Casimiro Castillo, Arroyo Tacubaya, BTS, ex *Oligoporus floriformis*, 4.VII.2002, 19°35'47"N, 104°25'52"W, H. E. Fierros-López col. (CZUG).

Comments. This was the only one species of *Scaphisoma* with maculated elytra previously cited from Mexico. Matthews (1888) described this species based on specimens from Jalapa (Veracruz) and Cerro de Plumas (Oaxaca). *Scaphisoma balteatum* can be recognized by uniform reddish coloration of pronotum, elytra orange with a black transversal band. Other diagnostic characters are parallel mesocoxal lines, sinuate metacoxal lines; elytra with sutural stria extended from apex to base, without basal stria; aedeagus (Figs. 4m–o) with median lobe symmetrical, apically pointed; parameres basally wider, with apex slightly curved toward inner area; internal sac with a portion of flagellum slightly coiled at the base of the median lobe. All characters of the specimens examined agree with the original description and illustration of *S. balteatum* (Matthews, 1888). This species is recorded for the first time from Costa Rica and Jalisco, Mexico.

Key to the Mexican species of *Scaphisoma* with maculated elytra

- 1 Mesocoxal lines parallel (Figs. 3b, c); elytra with yellow apex 2
- Mesocoxal lines parabolic (Figs. 3a, d); elytra with red or reddish brown apex 3
- 2 Metacoxal lines sinuate (Fig. 3d); pronotum reddish orange; parameres with preapical cavity; internal sac with flagellum loosely coiled in the median lobe and bearing small asperities (Figs. 4j–l) *Scaphisoma versicolor* **sp. nov.**
- Metacoxal lines parallel (Fig. 3a); pronotum dark brown or black; parameres without preapical modification; internal sac with flagellum closely coiled and striate (Figs. 4a–c) *Scaphisoma jaliscanum* **sp. nov.**
- 3 Metacoxal line convex (Fig. 3b); central area of pronotum with with black macula; aedeagus with symmetrical median lobe, which has lateral subapical projections (Figs. 4d–f) *Scaphisoma cortesaguilari* **sp. nov.**
- Metacoxal lines sinuate (Fig. 3c); pronotum uniformly colored; aedeagus with other characters 4
- 4 Pronotum black; ventrites dark brown; humeral area of elytra with black or brown macula (Fig. 1c); Aedeagus with asymmetrical median lobe, in dorsal view curved to the left (Fig. 4g) *Scaphisoma opochtli* **sp. nov.**
- Pronotum orange-red; ventrites reddish; humeral area of elytra red; aedeagus with symmetrical, straight and apically pointed median lobe (Fig. 4m) *Scaphisoma balteatum* Matthews

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References

- Ashe, J.S. (1984) Description of the larva and pupa of *Scaphisoma terminata* Melsh. and the larva of *Scaphium castanipes* Kirby with notes on their natural history (Coleoptera: Scaphidiidae). *The Coleopterists Bulletin*, 38, 361–373.
- Champion, G.C. (1913) Notes on various Central American Coleoptera, with descriptions of new genera and species. *Transactions of the Royal Entomological Society of London*, (1913), 58–169.
- Hanley, R.S. (1996) Immature stages of *Scaphisoma castaneum* Motschulsky (Coleoptera: Staphylinidae: Scaphidiinae), with observations on natural history, fungal host and development.

- Proceedings of the Entomological Society of Washington*, 98, 36–43.
- Horn, G.H. (1894) The Coleoptera of Baja California. *Proceedings of the California Academy of Sciences Second series*, 4, 302–449.
- Leach, W.E. (1815) Entomology. In: Brewster D. (Ed.) *Edinburgh Encyclopaedia*, 9. Baldwin & Cradocle, Edinburgh, pp. 57–172.
- Leschen, R.A.B. (1988) The natural history and immatures of *Scaphisoma impunctatum* (Coleoptera: Scaphidiinae). *Entomological News*, 99, 225–232.
- Leschen, R.A.B. & Löbl, I. (2005) Phylogeny and classification of Scaphisomatini (Staphylinidae: Scaphidiinae) with notes on mycophagy, termitophily, and functional morphology. *Coleopterists Society Monographs Patricia Vaurie Series*, (3), 1–63.
- Leschen, R.A.B., Löbl, I. & Stephan, K. (1990) Review of the Ozark Highland *Scaphisoma* (Coleoptera: Scaphidiidae). *The Coleopterists Bulletin*, 44, 274–294.
- Löbl, I. (1992) On some Scaphidiinae (Coleoptera: Staphylinidae) from Mexico and continental Central America. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 65, 379–384.
- Löbl, I. (1997) *Catalogue of the Scaphidiinae (Coleoptera: Staphylinidae)*. Muséum d'histoire Naturelle, Genève, 190 pp.
- Löbl, I. (2002) New species of *Scaphisoma* Leach (Coleoptera: Staphylinidae: Scaphidiinae) from Mt. Wilhelm, Papua New Guinea. *Acta Zoologica Academiae Scientiarum Hungaricae*, 48, 181–189.
- Löbl, I. (2003) Description of two new Scaphidiinae from South-India (Coleoptera: Staphylinidae). *Mitteilungen des Internationalen Entomologischen Vereins*, 28, 93–98.
- Löbl, I. & Leschen, R.A.B. (2003). Scaphidiinae (Insecta: Coleoptera: Staphylinidae). *Fauna of New Zealand*, (48), 1–94.
- Matthews, A. (1888) Fam. Scaphidiidae. In: Godman, F. D. & Salvin, O. (Ed.). *Biologia Centrali Americana. Vol. 2, part 1*. Taylor & Francis, London, pp. 158–181.
- Navarrete-Heredia, J.L., Newton, A.F., Thayer, M.K., Ashe, J.S. & Chandler, D.S. (2002) *Guía Ilustrada para los géneros de Staphylinidae (Coleoptera) de México / Illustrated Guide to the Genera of Staphylinidae (Coleoptera) of Mexico*. Universidad de Guadalajara-Conabio, Guadalajara, 401 pp.
- Newton, A.F.Jr. (1984) Mycophagy in the Staphylinoidea (Coleoptera). In: Wheeler, Q. & Blackwell, M. (Ed.) *Fungus / insect relationships. Perspectives in ecology and evolution*. Columbia University Press, New York, pp 302–353.
- Siméon, R. (1999) *Diccionario de la lengua Náhuatl o mexicana*. Siglo Veintiuno, México D.F., 783 pp.